PATENT

Attorney Docket No. SIC-04-012

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

RYUICHIRO TAKAMOTO, et al

Application No.: 10/711,548

Filed: September 24, 2004

For: BICYCLE SHIFT CONTROL APPARATUS THAT CANCELS A TENTATIVE SHIFT

Examiner: Marlon A. Arce Diaz

Art Unit: 3611

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This is an appeal brief for the above-captioned matter.

I. Real Party In Interest

The assignee and real party in interest is Shimano, Inc., a Japanese corporation having a principal place of business in Osaka, Japan.

II. Related Appeals And Interferences

There are no prior or pending appeals, interferences or judicial proceedings known to the appellant, to appellant's legal representative, or to the assignee which may be related to, directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. Status Of Claims

Claims 1-21 are pending under final rejection and are under appeal.

IV. Status Of Amendments

An amendment was submitted on March 14, 2006 subsequent to final rejection. The amendment made a minor amendment to the specification, and arguments were made for patentability. No amendment to the claims was made. An advisory action mailed April 6, 2006 stated that the amendment would be entered, but the arguments did not place the application in condition for allowance.

V. Summary Of Claimed Subject Matter

An embodiment of the claimed subject matter is shown in Fig. 3 and described at paragraphs [0024] - [0026] spanning pages 5-6 of the patent application. As applied to that embodiment, the subject matter recited in claim 1 is directed to:

A bicycle shift control apparatus comprising:

a threshold value setting unit (30a, page 6, paragraph [0025], lines 4-5) that sets a threshold value of a running condition for shifting a bicycle transmission (e.g., upshift and downshift threshold values shown in Fig. 4 that indicate the speeds at which an internal shifting hub transmission 10 (Fig. 1) is shifted);

a decision unit (programming of 25a, page 6, paragraph [0026], lines 1-5) that decides if a current running condition value (e.g., the current bicycle speed) passes the threshold value;

a tentative shift unit (additional programming of 25a, page 6, paragraph [0026], lines 1-6) that sets a tentative shift of the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value; and

a canceling unit (programming of 25b, page 6, paragraph [0026], lines 6-9) that cancels the tentative shift if the decision unit (25a) decides that the current running condition value varies from a previous running condition value by a determined value.

Fig. 6 in the patent application illustrates the subject matter of claim 1. The relevant description appears at paragraphs [0031] - [0034] spanning pages 8-9 of the application. Assume the bicycle speed is sampled at two consecutive times, say initially at Time1 and then later at Time2. The first time through the routine at Time1, the bicycle speed S is sampled in step S22, and then it is

determined in step S23 whether or not the bicycle speed S is greater than the upshift threshold value U(VP). If so, a tentative shift is set. If this is the first time that the bicycle speed S exceeds the upshift threshold value U(VP), then an upshift flag FU is set in step S28, and the bicycle speed S sampled at Time1 is stored in a memory array at location S(1) in step S30. The upshift flag FU is a convenient way of keeping track of the tentative shift status in software. The next time through the routine at Time2, the bicycle speed S is sampled again in step S22, and then it is determined in step S23 whether or not the bicycle speed S sampled at Time2 is greater than the upshift threshold value U(VP). If so, then bicycle speed S sampled at Time2 is stored in the memory array at location S(2) in step S32.

The distinctive part in the preferred embodiment occurs in step S33. In step S33, the bicycle speed S(1) sampled at Time1 is subtracted from the bicycle speed S(2) sampled at Time2, and the resulting difference is compared to a reference value SA. If the result of the subtraction is greater than the reference value SA, the tentative shift is canceled. The upshift flag FU is turned off in step S24, thereby indicating in the software a canceling of the tentative shift that was originally set by the "yes" determination in step S23 when going through the routine at Time1.

VI. Grounds Of Rejection To Be Reviewed On Appeal

Claims 1-21 stand rejected under 35 U.S.C. §102(b) as being anticipated by Fujii (US 2003/0071436 A1).

VII. Arguments

Rejection under 35 U.S.C. §102(b) over Fujii

Claims 1-21.

Fujii discloses a method and apparatus for controlling a bicycle transmission, for example, an internal gear changing hub (10) (Fig. 1). In general, the desired speed step (gear) VP of internal gear changing hub 10 is set according to wheel speed S. When the wheel speed S has departed from a desired range, a shift is made in the direction of the closest speed step, one at a time. More specifically, as shown by the flow chart in Fig. 6, the current gear VP of internal gear changing hub

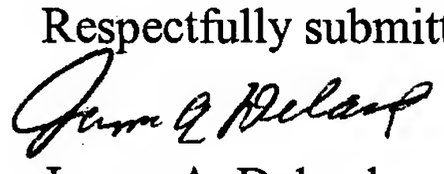
10 is acquired from a gear position sensor 26 (Fig. 3) and stored in Step S21, and the current wheel speed S of the bicycle is acquired from the speed signal from a hub generator 12 (Fig. 1) and stored in Step S22. In Step S23, a decision is made whether or not the current wheel speed S is greater than the upshift threshold value U (VP) for the current speed step VP as set forth in the table shown in Fig. 4. In Step S24, a decision is made whether or not the current wheel speed S is less than the downshift threshold value D (VP) for the current speed step VP as set forth in the table shown in Fig. 4.

When the current wheel speed S exceeds the upshift threshold value U (VP) for the current gear, the process moves from Step S23 to Step S25. For example, when VP = 2 (second gear), the process moves from Step S23 to Step S25 whenever the wheel speed S is greater than 16 km/h. In Step S25, a decision is made whether or not a time interval T1 has passed since the decision at Step S23. If not, the wheel speed S is acquired again in Step S26. In Step S27, a decision is made as to whether the currently acquired wheel speed S exceeds the upshift threshold value U (VP) for the current gear. If wheel speed S does not exceed the upshift threshold value U (VP), the process moves to Step S24 to cancel the potential upshift operation. On the other hand, if the wheel speed S still exceeds the upshift threshold value U (VP) in Step 27, then the process returns to Step S25, where again a decision is made as to whether the time interval T1 has passed since the decision at Step S23.

The examiner maintains that the tentative shift canceling feature recited in claim 1 is satisfied by step S24 in Fig. 6 of Fujii. However, applied to the Fujii embodiment, Fujii never compares two sampled speeds to each other, so nothing in Fujii "decides that a current running condition value varies from a previous running condition value by a determined value" as recited in claim 1. It is true that step S24 in Fujii determines whether or not a current speed is less than a downshift threshold value D(VP). It also is true that step S24 could be reached if it is determined in step S27 that a current bicycle speed S is not greater than an upshift threshold value, thereby canceling a tentative shift. For example, again assume that the bicycle speed S is sampled at two consecutive times, Time1 and Time2. The first time through the routine at Time1, the bicycle speed S is sampled in step S22, and then it is determined in step S23 whether or not the bicycle speed S is greater than the upshift threshold value U(VP). A "yes" determination sets a tentative shift, and a timer is set to count down a time interval T1. The routine loops through steps S25, S26 and S27 until either the

time interval T1 expires or else the bicycle speed S falls below the upshift threshold value U(VP). If the time interval expires, then the bicycle transmission upshifts accordingly. On the other hand, if the bicycle speed S falls below the upshift threshold value U(VP), the tentative shift is canceled. However, the tentative shift is *not* canceled in response to a comparison of two sampled bicycle speeds to each other, which would be covered by claim 1, but simply because the most recently sampled bicycle speed S fell below the upshift threshold value U(VP) stored in a table. Thus, Fujii neither discloses nor suggests the subject matter recited in claim 1, and the other claims, that a "decision unit decides that the current running condition value varies from a previous running condition value by a determined value."

Respectfully submitted,



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VIII. CLAIMS APPENDIX

CLAIM 1. A bicycle shift control apparatus comprising:

a threshold value setting unit that sets a threshold value of a running condition for shifting a bicycle transmission;

a decision unit that decides if a current running condition value passes the threshold value;

a tentative shift unit that sets a tentative shift of the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value; and

a canceling unit that cancels the tentative shift if the decision unit decides that the current running condition value varies from a previous running condition value by a determined value.

CLAIM 2. The apparatus according to claim 1 further comprising a control unit that provides a signal to shift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value a plurality of times.

CLAIM 3. The apparatus according to claim 2 wherein the control unit provides the signal to shift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value a plurality of times consecutively.

CLAIM 4. The apparatus according to claim 2 wherein the control unit provides a signal to upshift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value a plurality of times.

CLAIM 5. The apparatus according to claim 4 wherein the control unit provides the signal to upshift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value a plurality of times consecutively.

CLAIM 6. The apparatus according to claim 4 wherein the control unit immediately provides a signal to downshift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value.

CLAIM 7. The apparatus according to claim 1 wherein the current running condition comprises bicycle speed.

CLAIM 8. The apparatus according to claim 7 wherein the decision unit is adapted to receive a plurality of the running condition values for a single revolution of a bicycle wheel.

CLAIM 9. The apparatus according to claim 8 wherein the decision unit is adapted to receive the plurality of running condition values from an alternating current generator.

CLAIM 10. The apparatus according to claim 1 wherein the current running condition comprises crank RPM.

CLAIM 11. The apparatus according to claim 1 wherein the decision unit decides whether the current running condition value passes the threshold value for a determined time period.

CLAIM 12. The apparatus according to claim 11 further comprising a control unit that provides a signal to shift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value for the determined time period.

CLAIM 13. The apparatus according to claim 12 wherein the control unit provides a signal to upshift the bicycle transmission when the decision unit decides that the current running condition value passes the threshold value for the determined time period.

CLAIM 14. The apparatus according to claim 1 wherein the canceling unit cancels the tentative shift if the decision unit decides that the current running condition value exceeds the previous running condition value by the determined value.

CLAIM 15. The apparatus according to claim 1 wherein the threshold value setting unit sets an upshift threshold value and a downshift threshold value, wherein the tentative shift unit sets a tentative upshift of the bicycle transmission when the decision unit decides that the current running condition value passes the upshift threshold value, wherein the canceling unit cancels the tentative upshift if the decision unit decides that the current running condition value varies from the previous running condition value by the determined value, and further comprising:

a first control unit that provides a signal to upshift the bicycle transmission when the decision unit decides that the current running condition value passes the upshift threshold value a plurality of times; and

a second control unit that provides a signal to downshift the bicycle transmission when the decision unit decides that the current running condition value passes the downshift threshold value.

CLAIM 16. The apparatus according to claim 15 wherein the first control unit provides the signal to upshift the bicycle transmission when the decision unit decides that the current running condition value passes the upshift threshold value a plurality of times consecutively.

CLAIM 17. The apparatus according to claim 15 wherein the decision unit decides whether the current running condition value passes the upshift threshold value for a determined time period.

CLAIM 18. The apparatus according to claim 17 wherein the first control unit provides the signal to upshift the bicycle transmission when the decision unit decides that the current running condition value passes the upshift threshold value for the determined time period.

CLAIM 19. The apparatus according to claim 15 wherein the second control unit immediately provides a signal to downshift the bicycle transmission when the decision unit decides that the current running condition value passes the downshift threshold value.

CLAIM 20. The apparatus according to claim 15 wherein the current running condition comprises bicycle speed.

CLAIM 21. The apparatus according to claim 15 wherein the current running condition comprises crank RPM.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None